Shifting Paradigms

Unpacking Transformation for Climate Action

A Guidebook
for Climate Finance
& Development Practitioners

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The GIZ Climate Finance Readiness Programme (CF Ready) supports partner countries to strengthen their capacity to use climate finance well, and in particular to prepare to access the Green Climate Fund. The programme works in ten countries and one region ranging from Least Developed Countries to Emerging Economies. An important pillar is supporting national climate finance institutions in their coordination work and in gaining accreditation under GCF's direct access modality. Furthermore, the programme provides strategic and conceptual support in developing national climate strategies and policy packages for ambitious, climate-resilient, low-carbon development paths. A third pillar is the global exchange of experiences. The explicit objective of the programme is to support the transformational use of climate finance in the countries.

PREFACE

by Vera Scholz

Head of Division, Environment and Climate Change, GIZ

"Business as usual is not an option"—that is what the German Advisory Council on Global Change (WBGU) stated in its report on 'the great transformation' in 2011. Planetary boundaries, especially with respect to greenhouse gas emissions, are already being crossed. And last years' experience has shown that the world has not yet undertaken an adequate response to halt the rise of greenhouse gas emissions. Instead, total annual emissions continue to increase—and are doing so in both developed and developing countries alike.

Finding adequate responses to climate change and prompting transformational processes is a challenge for developed countries, but may be an even greater challenge for decision-makers in developing countries where economic growth is very high on the agenda. Why should they engage in transformational change towards a climate resilient and low carbon society which may hinder rapid economic growth? Such a transition, however, can help solve the dilemma of attaining economic growth without destroying the natural capital stock in the process. And in fact many developing countries are already implementing transformational initiatives, for example the Green Growth Strategy in Vietnam and the Plan Solaire in Morocco.

Transformation in many respects is core to GIZ's work. In many developing countries and emerging economies GIZ is explicitly tasked with supporting transformational change to low carbon and climate resilient development: the Climate Finance Readiness Programme (CF Ready), which GIZ is implementing jointly with KfW on behalf of BMZ, aims to foster the use of climate finance for transformational processes. Therefore, a better understanding of transformational change is crucial and also the reason for our cooperation with the Wuppertal Institute.

This guidebook—developed by the Wuppertal Institute—is meant to accomplish two things: i) to provide some hands-on examples of how the transformational impact of capacity development activities can be enhanced and ii) to give some guidance on identifying which activities should be funded. Applying these guidelines will (hopefully) help to create the enabling conditions needed to increase the transformational impact of climate finance. Moreover, this guidebook should be seen as a bridge between the work of development cooperation and the global debate on transformation by giving guidance and demonstrating the practical value of this concept. We hope that it will not only be useful to GIZ but also to other institutions in showing what can actually be accomplished.

– Vera Scholz

1 Introduction

An effective response to climate change that assures a sustainable development pathway will require a fundamental transformation towards low carbon, climate-resilient societies. As the German Advisory Council on Global Change states, *"This major transformation will require technological advances, new concepts of welfare, diverse social innovations, and an unprecedented level of international cooperation."*[1]

This ambition is beginning to be reflected in international climate finance: the Green Climate Fund of the UNFCCC aims for a "paradigm shift". Other international funding mechanisms demand that projects should contribute to "Transformational Change". However, beyond a general call for higher levels of ambition of both activities and financial support, the concept is still vague in the climate change discussion and its systematic adoption is only just beginning.

Countries wishing to access climate finance for mitigation and adaptation activities face a bewildering variety of bi- and multilateral funding options, access modalities and spending rules. Many governments in low- and middle-income countries, as well as stakeholders within these countries are unaware of the whole range of options, and national finance institutions are often not well set up to absorb and channel the high funding levels required for ambitious actions.

Programmes such as the GIZ's Climate Finance Readiness (CF Ready) Programme[2] are supporting interested countries in alleviating these challenges by strengthening the capacities of countries to access and deploy available climate finance effectively, and thus make them "ready for climate finance".

1 WBGU 2011a.

2 www.giz.de/expertise/html/11492.html

A capable national institution for planning for, accessing and managing financial resources is an important aspect of a country's readiness for climate finance task—in particular with regard to the Green Climate Fund. Among many others, such an institution will have to meet the task of designing programmes and strategies, or selecting actions that support a paradigm shift or have a transformational impact. Governments as well as project developers face a number of challenging questions about how to do this in a sound but feasible manner. How can we distinguish a "normal" mitigation or adaptation project from one that brings about Transformational Change? Or, more fundamentally: is this even the right question to ask in our endeavour to support Transformational Change?

This guidebook is a first step in providing answers to these questions. We aim to

- attempt a workable definition of Transformational Change in the climate change context (chapter 2.1);
- differentiate Transformational Change from sustainable development (chapter 2.2)
- outline important characteristics of Transformational Change processes (chapter 2.3)
- define guidelines for supporting Transformational Change (chapter 3.2); and
- give examples of tools and methods that can support Transformational Change (chapter 3.3).

This guidebook is intended to be a useful tool for both donors and recipients of climate finance, for international and national climate finance experts as well as developers of mitigation and adaptation activities. The guidelines and tools in this guidebook offer a catalogue of different elements that constitute a holistic approach, but whose parts can be combined for use as appropriate in individual cases.

We are building on well-established insights derived from complex systems research, but combining these insights with lessons learned from innovation and transition studies. Users wishing to delve deeper into the theory behind this guidebook are invited to refer to our background document,"Navigating a New Agenda".[3] This paper provides interested readers with some core theoretical aspects of Transformational Change that we touch in this paper in an easily digestable questions-and-answers format.

3 Available at: http://wupperinst.org/en/projects/details/wi/p/s/pd/482/

We hope that this document helps to get a better understanding of the concept of Transformational Change in the context of climate mitigation and adaptation strategies that also aim to meet wider sustainable development goals. We are convinced that the concept of Transformational Change has great potential for unlocking some of the persistent challenges and path dependencies that currently hinder us from reaching the climate protection and sustainable development goals to which the global community has committed.

2 What do we mean by Transformational Change?

2.1 Defining Transformational Change

Paradigm Shift and Transformational Change in International Climate Finance

Significantly higher ambition is needed to combat climate change and its already irreversible effects—current practice has simply not sufficed to reverse the climatic trend. This has consequences for the development of programmes and projects, but also for financial support: calling for a higher level of ambition in developing countries means that levels of funding need to shift to higher ambition levels as well. This conviction drove the decision to implement the Green Climate Fund (GCF) of the UNFCCC and other climate finance instruments.

> "... promote the paradigm shift towards low-emission and climate-resilient pathways"
>
> —GCF Governing Instrument

However, while there seems to be a common creed to raise the ambition of both finance and activities, explicit declarations of how a paradigm shift or a Transformational Change may be defined in the climate change context are still missing. In its Governing Instrument, adopted in Durban in 2011, decison makers defined the GCF's key objective: *"In the context of sustainable development, the Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change"*[4]

In previous discussions of the Transitional Committee, the term "transformational change" had been replaced by "paradigm shift", albeit with generally the same meaning. It bears noting that in some supporting documents to the GCF, "transformational change" is still in use.[5]

4 Decision 3/CP.17: Launching the Green Climate Fund, Annex.

5 see Harmeling and Grießhaber, 2013

"... potential to catalyse transformational change towards low-carbon development"

—NAMA Facility

However, the GCF has to this date not defined what a paradigm shift might mean in concrete terms. Some clarity may be gained in upcoming decisions on the Fund's result areas and investment policies, but we expect the definition to be circumstantial (i.e. by means of funding priorities). The NAMA Facility is another prominent promoter of the transformational change concept in the climate finance domain: *"The NAMA Facility aims to support the concrete implementation of highly ambitious projects that fit into the context of a broader NAMA and have the potential to catalyse transformational change towards low-carbon development."*[6]

6 NAMA Facility 2014

Similarly to the GCF, the NAMA Facility currently foregos an explicit definition of what is meant by "transformational change" in its funding context. Projects submitted to the Facility do, however, have to argue how they will contribute to a transformation within a sector or on a national level. Factors delineating Transformational Change potential include contributions to broader programmes or policy frameworks, change of prevailing structures of a sector contributing to high emissions, impact beyond the project scope, institutional capacity building, private sector engagement, innovation, replicability, and learning processes fostered by the NAMA. These can all be considered important aspects of potentially transformational processes. However, their individual importance varies strongly with the individual project context.

Our Understanding of Transformational Change

Due the relative novelty of the concept especially in the climate and development domain, there is no single, generally acknowledged definition of Transformational Change. The definitions used are not precise enough to clearly determine whether a specific process can be considered transformational or not. When it comes to defining Transformational Change, we are at the same stage that the world was before 1987 with respect to defining the concept of sustainable development: the Brundtland report of Transformational Change has still to be written! Given the complexity of the topic, it is highly understandable that International Climate Finance institutions choose to describe aspects that might contribute to Transformational Change instead of a definition that may raise a political debate.

In this guidebook we broadly follow a definition given by the Sustainable Transitions Research Network, which talks about "transformative change at the systems level, including major changes in production, consumption", and definitions given by some of its members who refer to "radical, structural change of a societal (sub)system" or "a fundamental change in structure, culture and practices".[7]

7 Grin et al. 2010.

We define Transformational Change as: A structural change that alters the interplay of institutional, cultural, technological, economic and ecological dimensions of a given system. It will unlock new development paths, including social practices and worldviews.

In the following two sections, we will further outline this concept: firstly, we will draw a distinction between Transformational Change and sustainable development. Then we will describe some key characteristics of transformation processes.

2.2 Transformational Change & Sustainable Development

Two Distinct Concepts

In public discourse the concept of Transformational Change is generally used in (implicit) connotation with the goal of sustainable development[8], sharing a common conviction that switching to genuine sustainable development pathways will only be possible through transformational (i.e. massive and structural) change—not only on a technological level, but also on political, social and cognitive levels.

We believe that it is important to clearly distinguish between the two concepts (see also Figure 2.1):

- Sustainable development is a normative concept describing the direction and the goal of development.
- Transformational Change is a concept describing the intensity or degree of change.

In this sense, Transformational Change has no normative connotation on its own. A crucial difference to non-structural ("normal") change is a shift of predominant paradigms.

Directions of Change

Normatively, change can lead to a "better" as well as a "worse" development, and may also lead to an outcome in stark contrast to sustainability. This also holds true for deeper and more fundamental paradigm shifts.

Wars may serve as an example: the breakout of armed conflicts between opposing nations entails a number of paradigm shifts across all dimensions of society within these nations. Moreover, these paradigm shifts lead to highly unsustainable outcomes, depleting natural resources, ecosystems, national economies, and human health. In other words: "War … is in direct opposition to sustainability." (Clark 2008)

Other paradigm shifts have led to ambiguous consequences with respect to sustainable development. The second industrial revolution brought tremendous economic growth and improvements in

8 Homer-Dixon 2009; WBGU 2011b; UN 2012.

living standards for many, but also resulted in social upheaval and unemployment, as well as in increased environmental deterioration.

Figure 1 necessarily simplifies the multi-dimensional nature of a change process: the direction of change is given in only one dimension —while factually sustainability has many dimensions: social gains may come with ecological losses; changes contributing to climate change mitigation may increase local pollution. In practice this makes it difficult to make an overall assessment of what sustainable development is. However, conceptually it becomes clear that when discussing Transformational Change it is also absolutely vital for the (intended) direction of change to be defined.

Changing Pathways

Our world and all of its subsystems encounter constant change— we are on a continuous development pathway. But as much as the state of the system changes, fundamental pathways often stay the same (on the left side in Figure 1). However, transformational Change

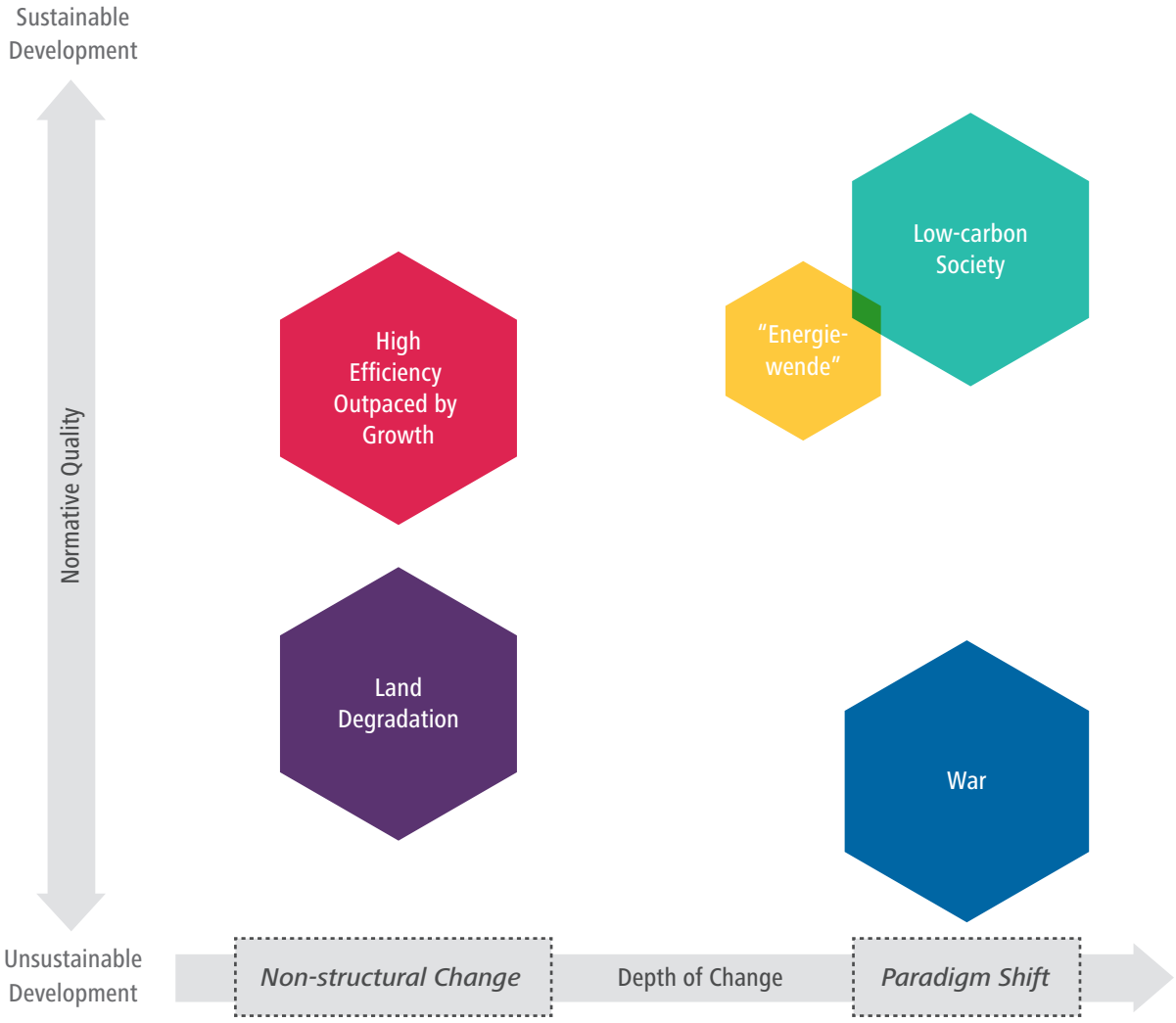


Figure 2.1
Sustainable development and Transformational Change relate to different dimensions: the direction and the intensity of change (own illustration)

is not only about changing the given status (which is, in any case, subject to constant change) but is about fundamentally changing the pathway.

Land degradation is a typical example of constant overuse of resources depleting arable soils over time, due to a prevailing use paradigm that cannot be sustained by the available land. Land degradation can be classified as a constant process of change towards non-sustainability that results from upholding an unsustainable status quo. Technological fixes such as soil fertilisation may be able to slow down the process for a period, but without a shift towards sustainable use patterns, lands continue to be degraded over time.

Changing use patterns towards sustainability is not an easy task. It requires shifts in paradigms for communities to change their pathways of development.[9]

9 An example of alternative paradigms in a water management system is given on p. 32

Amendment or Innovation?

A key question is whether it is even possible to reach a sustainable development pathway by merely mending the system. In other words: if we stay on the left side of the above figure, how far is it possible to move up towards sustainability? Increasing efficiencies (energy and resource use) will definitely help to improve the system and move it towards sustainable development. However, efficiency gains are commonly outpaced by growth rates—resulting in net increases of environmental damage.

With respect to low carbon development there is a growing consensus that a low carbon development pathway in line with the 2 °C limit can only be reached by a paradigm shift. Consequently, improving the system will not reduce emissions fast enough—an innovation of the system or, in other words, Transformational Change is needed. It is not possible to go high enough (and fast enough) on the left hand side of the figure—this is only possible on the right.

In conclusion, in order to address climate change adequately, the dimensions of sustainable development and transformational change are inextricably linked. Therefore, in this guidebook, we adopt the shared normative notion that this direction should be geared towards low carbon, climate-resilient, resource efficient, socially just and other types of sustainable societies. However, in order to navigate the path towards genuine sustainable development, we find it very helpful to distinguish between the direction and the depth of the change process ahead of us.

The German Energiewende
An Example for a Transformational Change?

It is extremely difficult, possibly unfeasible to assess whether an ongoing process truly constitutes Transformational Change. However, with regards to energy transition in Germany, we can identify clear indications of paradigm shifts which have taken place.

- *The nuclear phase-out and long-term support for renewable energy technologies are very stable (although the speed and design of the transformation process are a matter of great debate). New technologies are becoming widespread. New actors and business models in the power sector have emerged.*
- *The public perception of renewables has fundamentally changed. 20 years ago wind and photovoltaic energy were largely classified as immature, while today they are considered as realistic alternatives for energy generation (despite existing challenges for further development). Currently, the increasing share of renewables is fundamentally challenging the concepts of how the electricity market should work.*
- *There is now the need to change legal frameworks well beyond support mechanisms for renewables. At the same time, increasing shares of renewables have ultimately changed business models for farmers, who now earn a large share of their income through energy production—which impacts on cultural values, beliefs and coalitions in society, reaching well beyond the direct economic effects.*

However, the necessary transformation towards a low carbon society is still more comprehensive: it needs to involve all sources of GHG emissions, not only the power sector. This may imply much more fundamental shifts of governing paradigms in German society and the economy as a whole.

In consequence, we would consider the German Energiewende an—ongoing—transformation process. Key milestones date back as late as the 1980s, and its final outcome is still open. Its future will very much depend on the political will to adapt or fundamentally change necessary laws and business models.

The Energiewende can provide us with some valuable lessons learned for Transformational Change:

- *The name Energiewende is fairly new. However, the process as such has been going on for more than 30 years already. It has outlasted administrations of varying political compositions.*
- *The process is deeply rooted in a societal discourse on a clean, safe and democratic energy system, and strongly driven by an active civil society.*
- *Innovative policy design and institutional learning processes were a prerequisite for advancing renewable energy technologies.*
- *Involving new actors and creating new business models outside of the current path of the power industry stirred innovation, societal acceptance and shifted paradigms of the energy sector.*

Paradigm Shifts in Developed and Developing Countries

Energy systems of developed countries need to be fundamentally transformed in order to enable a low carbon development pathway. In many poorer developing countries, centralised, fossil-fuel based energy systems have not yet been fully established (e.g. in large rural areas that do not have access to electricity). This means that a switch to low carbon development could be perceived quite differently: in developed countries, the focus is on energy security and low carbon development meaning that existing infrastructure needs to be replaced, while in developing countries the focus is on overcoming energy scarcity and achieving low carbon development, meaning that appropriate infrastructure often needs to be established from scratch.

Consequently, it is often argued that developing countries would not need a truly Transformational Change, but "only" a redirection of their development activities. We would strongly disagree with this viewpoint for the following reasons.

The required transformation necessitates a change in the development pathway. This, in turn, requires paradigm shifts within the utilities, planning and energy organisations—e.g. a shift from narratives such as "we need more coal fired power plants" to a commitment to fundamentally new innovations such as decentralised, renewable mini-grids, with fundamentally different new business models and related narratives. The process of building new infrastructures (instead of replacing existing ones) allows for the introduction of change with fewer redundant assets. However, this perspective focuses on the technological/infrastructure dimension only. When the economic, cultural and institutional dimensions of the problem are taken into account, it becomes clear that the ingrained values, beliefs, knowledge, habits, business models and power structures require paradigm shifts of a comparably fundamental nature in both developed and developing countries

2.3 Characteristics of Transformational Change

In the following section, we briefly outline key characteristics of Transformational Change processes, which are taken from transition and innovation theory.[10] They form the basis for the guidelines and tools in the second part of this guidebook. Table 2.1 gives an overview of our findings.

10 More information on many of the key characteristics of Transformational Change is compiled in our background paper, "Navigating a New Agenda" (see Recommended Reading at the end of this guidebook)

Intensity / Degree of Change

Successful Transformational Change means that a fundamental restructuring of the system at hand has taken place. It involves a shift of predominant paradigms.

Transformation processes go hand in hand with changes in technology (new technologies or new uses for established technologies), institutions (including new laws and power structures), culture and social relations (including changes in values, beliefs, discourses and world views), the economy (new business models and wealth distribution) and the relation to ecology (new or limited access to resources, a reduction in or increase to the strain on ecosystems). They are not, therefore, simple, one-dimensional change processes, but complex and multi-dimensional. Transformations in one subsystem may inadvertently lead to transformations or a reinforcement of the status quo in others. In successful transformations, the dynamics in different societal subsystems and the interactions between these subsystems are co-evolutionary processes which reinforce each other.[11]

11 Grin et al. 2010.

Ignoring the multi-dimensional nature of transformational processes can lead to the omission of important barriers to change. Even if the multi-dimensionality of a transformational process is taken into account, the complexity of a system's dynamics may still result in unintended and unforeseen consequences. It follows that structural change processes and paradigm shifts cannot be completely planned and strictly steered. However, it is possible to support transformations

by increasing factors for successful transformations, and, as a result, to help directing the system towards an intended development pathway.

Social Dynamics / Drivers of Change

Transformational Change processes often follow a recognisable (if idealised) pattern of social dynamics. Innovations of any sort (whether social, technological, cultural, economic, ecological or a combination of any of these) are pioneered by individuals or small groups with a vision of the future that differs from mainstream thinking. These pioneers may be individuals, but can also be organisations of different sorts *(e.g. NGOs, think tanks, private or public sector agencies, national or international organisations etc.)*. Their motivation for a desired change can take various forms, ranging from normative and idealist motivations to economic or other income-maximising ones.

These pioneer-innovators may act as promoters and multipliers of their concepts, but often this takes a division of labour between agents sharing the new vision: mediators, advocates, funders or early adopters who form networks and communicate their visions to drive behavioural or political change. Taking into account the multi-dimensional nature of transformational processes, coalitions that may form around a common vision can consist of actors who have not previously worked together: for example, companies and NGOs.

A crucial success factor for any transformational processes is to define and circumscribe what successful Transformational Change will look like in a given country. If pioneers and change coalitions can demonstrate the feasibility, legitimacy and desirability of their ideas, more actors will join, and support will spread further through society. It will enter the societal mainstream and may eventually become the new predominant paradigm.

Transformational Change impacts on power structures and power distribution. Transformational processes therefore are seldom smooth, and may encounter opposition by established forces and opposing interests *(e.g. The process of Indian independence faced strong opposition by established British rule, but was also accompanied by at times violent internal power struggles between different religious and political groupings*).

Temporal Dynamics / Time Frame

Transformational Change processes are long-term processes. A transformation process towards low carbon and climate-resilient development will take longer than a legislative period and even more than a generation (>20 years).

The dynamics of change can be quite different—and can also depend on what drives the change. Generally, gradual changes i.e. incremental steps will eventually add up and erode the stability of the old system and unlock options for developing a new system. The dynamics of change can accelerate dramatically in the case of obvious and immediate crises.

The progress of change is not always immediately apparent *(e.g. steam builds up in a pot over a period of time before the lid is blown off.)* And the manifestation of change will often be the result of processes that started a long time previously. To outsiders, such change may only become apparent when a tipping point is reached *(e.g. Fukushima can be recognised as the* ***tipping point*** *for the "German Energiewende")* although the transformation may already have been in progress for a very long time *(e.g. the "German Energiewende" came about as a result of decades of protest against nuclear power and a continuous increase in support for renewables).*

TRANSFORMATIONAL CHANGE PROCESSES CAN BE CHARACTERISED BY

INTENSITY *Degree of Change*	SOCIAL DYNAMICS	TEMPORAL DYNAMICS *Time Frame*
A fundamental restructuring of the system	Pioneers with a vision of change at an early stage	Long timespans (often more than a generation)
A shift of predominant paradigms	Emergence of new networks and coalitions	Gradual changes and incremental steps that add up to a systemic change
Complex, non-linear change processes	Conflicts as power structures change	Tipping points where ongoing but less apparent change processes break the former stability of the system
Change in multiple dimensions (technological, institutional, cultural, social, economic, ecological)		

Table 2.1
Overview of key characteristics of Transformational Change processes.

3 Facilitating Transformational Change

3.1 Putting This Guidebook Into Practice

The characteristics of Transformational Change make it impossible to assess whether one individual action is "transformational" or not. Also, whether or not a Transformational Change process has been successful can only be assessed after the fact—which would be decades after any individual intervention was planned or implemented. Furthermore, complex transformational processes are influenced by a manifold of factors—a wide variety of planned activities as well as unplanned coincidences.

As a result, contributions towards Transformational Change must be assessed in a fundamentally different way to other existing eligibility criteria for climate finance (e.g. reduction potential in tonnes CO_2e). In this section, we propose two means of tackling this challenge, which together offer a catalogue of different elements that constitute a holistic approach, but whose parts can be combined for use as appropriate in individual cases.

» Guidelines for Transformational Change

Here we outline "success factors", which can be considered as good practice in supporting Transformational Change. These guidelines are meant to help those experts and institutions tasked with selecting potentially transformational actions for climate finance as well as those designing climate strategies, programmes and projects (that would consequently draw on climate finance).

» Tools and methods for designing or selecting actions

A project considered to be particularly supportive of a Transformational Change process in one country may be considered as being no more than "nice to have" in another. For example, supporting pilot projects may be highly relevant at an early stage of a transformational process, while at a later stage other interventions are more suitable. To adequately reflect this complexity, we propose a set of tools that can be helpful to design or select suitable actions.

Supporting Climate Finance Readiness

This guidebook has been designed to assist developing countries in their climate finance readiness. In this context, designing and selecting strategies, programmes and individual actions supportive of a Transformational Change will play a crucial role for a country's access to climate finance. The guidelines and tools in this section aim at supporting this process by assessing project proposals in terms of their capacity to support Transformational Change in two general ways:

TOP DOWN

Guidelines & tools for the development of strategies and programmes. The guidebook can be used on a national level to design a transformational climate finance programme. The tools (3.3) can serve. to gain clarity about the system in question, to identify key barriers and leverage points on the way towards a low carbon and climate-resilient development path. From this, country-specific eligibility criteria for projects can be developed with the help of the guidelines (3.2). The projects should then be selected in such a way that the portfolio of selected projects as a whole addresses all key barriers.

BOTTOM-UP

Guidelines & tools for the selection of projects and activities. Using the guidelines and/or tools can be a key eligibility criterion in itself. A country may choose a more open project proposal process, where only long-term objectives are explicitly mentioned and barriers and leverage points are not fully defined. Instead, project proposers may be asked to outline how they see the system in question, what barriers they have identified, which of these they intend to overcome and how. In a project proposal it would be necessary to describe how the guidelines were applied, what tools were used and what conclusions were drawn.

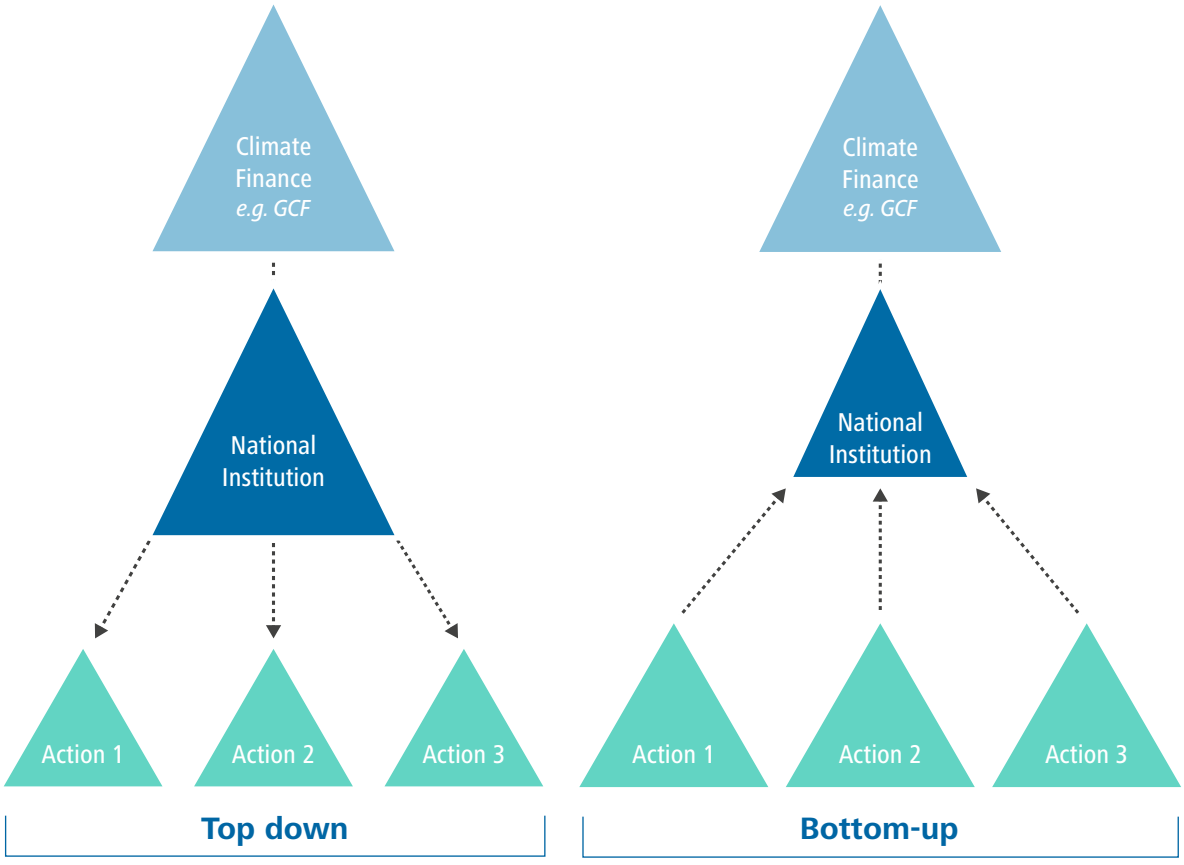


Figure 3.1
Illustrates how, in developing countries, the guidebook could support national institutions in channelling financial resources to concrete actions on the ground as outlined above.

Other Uses and User Groups

However, beyond the usefulness for national finance institutions, this guidebook can be used by different actors involved in financing, designing and implementing projects.

We would encourage users to consider both the guidelines and the tools proposed below. However, depending on the type of their involvement, users can put varying emphasis on different aspects of this guidebook.

To illustrate:

- The guidelines can serve as parameters for project selection by bilateral and multilateral funding organisations. They could form the basis for qualitative indicators that project proponents would have to answer in a narrative, similar to the "bottom up" approach above.
- The tools may be used as good practice within, but also beyond, climate mitigation and adaptation in the design of concrete actions by implementing organisations such as national and international development agencies or private project developers.

3.2 Guidelines for Transformational Change

From the characteristics of Transformational Change we condense a set of good practice guidelines that serve as success factors to support a paradigm shift or Transformational Change. Some of these guidelines are specifically tuned to this purpose; others connect with existing good practice in capacity development that aims to support sustainable development. However, even where overlaps with current practice in development cooperation exist, we see a strong need to intensify the thorough implementation of these guidelines in order to promote Transformational Change.

Dare To Leave The Beaten Track!

Aiming for Transformational Change and striving to support a paradigm shift means a radical increase in ambition and includes testing new approaches. However, experimenting with new concepts and real innovation carries the risk of failure of new, unproven approaches.

Consequently, any structure that aims to support genuine Transformational Change must be open to a certain degree of experimentation. If mitigation and adaptation are supposed to support Transformational Change, climate finance must allow for the possibility of some degree of failure.

Think In Portfolios—Not In Single Projects!

No single project will change the system! Many small steps over a long period of time will be necessary to bring forth a Transformational Change. Consequently, supporting transformational processes within a country will mean moving from a project-by-project approach to a more integrated portfolio approach.

Project development should start with a systemic perspective: what is needed to change the system—and what can be my contribution? This means moving away from a focus on individual project outcomes to an evaluation of their impact on the overall goal (see also 3.3.3).

The alignment of activities with national processes and other international donors is crucial. A climate finance programme aiming for Transformational Change will need to make sure that all barriers are being addressed—even if they are addressed by someone else.

The effectiveness of climate finance programmes should also be evaluated on a portfolio level, in order to allow for experimentation and the potential failure of individual projects (see above).

Look Across Sectoral Borders!

Transformational Change is multidimensional. This means that solutions will, most likely, involve cross-sectoral approaches. Inter-departmental and interinstitutional cooperation on various levels will eventually be key at the point in time when far-reaching innovations towards sustainable development become mainstream solutions. In tackling climate change it is, therefore, "it is imperative that not only environmental organisations but, increasingly, all types of organisations be involved" and take ownership of mitigation and adaptation practices.

Assess, Don't Measure!

It is not possible to measure whether a single project is transformational or not. But it is possible to assess its probable contribution to a transformational project portfolio. The choice of individual actions geared at low carbon and climate-resilient development should, therefore, crucially depend on their contribution to Transformational Change processes and the extent to which they are embedded into the overall transformational goal. As Transformational Change encompasses change in various dimensions, it is necessary to develop processes that can adequately assess interventions with respect to impacts in all relevant dimensions. Social, institutional and cultural aspects need to be given comparable attention to more easily quantifiable effects, such as the financial or GHG reduction impact of an intervention.

Develop Common Goals and Visions!

A crucial success factor for any transformative processes is to collectively define and circumscribe what a successful Transformational Change will look like in a country; to build a collective long-term vision that enables stakeholders to develop and refine strategies and to streamline approaches. This vision of change needs to be broad enough to allow for consensus but sufficiently defined to make it possible to implement relevant actions.

Transformational goals need to be determined by stakeholders in the country: government officials on different levels as well as civil society and local entrepreneurs must be included in the development of visions and their implementation. Support for Transformational Change crucially depends on multi-stakeholder processes that disseminate the feasibility and necessity of Transformational Change throughout society.

Support Long-Term Decisions!

A key barrier to Transformational Change towards sustainable development is short-termism in decision-making—whether accounting rules requiring short payback periods or politically-motivated thinking during election periods. Supporting Transformational Change also means support for long-term planning and decision-making. This in itself often involves paradigm shifts or major reforms of societal sub-sectors (e.g. institutional reforms or changing public accounting procedures), which are not apparently linked to climate change and consequently beyond the scope of projects that focus on mitigation or adaptation.

Allow Flexibility for Windows of Opportunity!

Transformational Change is most likely to start within windows of opportunity. Such windows often open up during physical or political crises, but can also be opened by conscious political choice, such as the implementation of favourable policies. Lamentably, such openings are beyond the possibilities of rigorous planning. System thinking (see 3.3.1) may be a helpful tool to help determine potential windows of opportunity and how they could be used.

This could result in developing a proposal for a new policy and having it ready in case, for example, a new government comes to power or a disaster causes a shift in public opinion about certain technologies etc. Using windows of opportunity also requires donor flexibility: a project receiving climate finance should be allowed to spontaneously adapt in order to respond effectively to changing circumstances.

Transformation Needs Lasting Support!

Transformational Change is a long-term process. In consequence, it is not sufficient to look for "quick wins". If climate finance is to support Transformational Change, some of the activities supported must aim to provide the basis for long-term successes, even if their impacts may not be apparent in the short term. As described in more detail in section 3.3.2, the success of transformation processes eventually depends on changes in regulatory frameworks and broader societal anchoring.

As prerequisites, the development and enforcement of new laws require capable institutions, and the societal acceptance of new approaches needs information, debate and visible advantages. These success factors for Transformational Change need to be fostered continuously. Donors and partner countries should prepare for longer-lasting support. However, the impact may only become visible long after a potential climate finance project has ended—and the impact will not, in all likelihood, be clearly or fully attributed to any single intervention.

3.3 Tools for Supporting Transformational Change

In this section we describe three concrete tools for supporting a Transformational Change process. These tools can help national institutions in developing countries to help to design strategies and select specific actions, but can also assist other actors to design programmes and activities that have high transformational impacts (see 3.1). Obviously, these tools cannot guarantee that an action will bring about a transformation. First and foremost, embarking on a transformational pathway requires an ambitious vision of change, and strategic choice to implement strategies and actions supporting this vision.

The guidelines outlined in the previous chapter can serve as a frame of reference for what such a strategic choice entails. The tools described in this chapter are meant as a means of supporting this choice as effectively as possible.

We have selected three tools from the wide variety of approaches[12] in existence because they

- represent holistic approaches to planning and selection of interventions;
- rely on multi-stakeholder dialogues as a basic premise;
- can be used for very different kinds of interventions, whether these are projects, programmes or policy packages; and
- exemplify good practice in three important procedural stages: (1) defining the problem scope and the wider system; (2) identifying the state of the system in relation to a given problem; and (3) integrated planning for a transformational project portfolio.

12 As an example, CapacityWorks by the GIZ is an excellent manual, albeit with a different focus. See www.giz.de/en/ourservices/1544.html for reference.

Systems Analysis and Mapping (3.3.1) should be drawn at the absolute outset of decisions about those actions that may have the most transformational impact. By drawing maps of the targeted system, the relevant actors and the most prevalent barriers "around" the problem you wish to address, you can find causes and effects that may not have been obvious at the beginning. Drawing these kinds of maps and discussing them with stakeholders may also bring to light the most effective sequence of measures to take and which measures to prioritise. The goal of this tool is, therefore, to define the problem itself and its scope and to develop a systemic understanding of actors, processes and barriers related to the targeted problem.

The Phase Model (3.3.2) represents an intermediate stage of decision-making. It helps to identify the state of the targeted system in relation to a given problem. Depending on this state, different (sets of) interventions will have the greatest potential to have transformational effects. The goal of this tool is, therefore, to refine your approach to a problem and to preselect possible interventions.

The Backwards Mapping Approach (3.3.3) allows for the integrated planning of concrete actions in order to reach a transformational goal and to determine how any given action contributes to reaching this goal. Distinct from the commonly used "log-frame" approach to project planning, it is supposed to open the focus from a narrow project-by-project view to a more holistic one, where different projects can be seen as "parts of a puzzle" that address different aspects of a portfolio and are steps towards a common long-term goal.

We have consciously limited ourselves to relatively short descriptions of the tools we propose. Our focus is to demonstrate how they can be put to good use within the context of Transformational Change. Together with the guidelines, the tools form a systemic and integrated course of action. They are applicable to planning for Transformational Change in both mitigation and adaptation —despite the structural differences in the two fields.

Table 3.1
Overview of proposed tools

SYSTEMS ANALYSIS & MAPPING	PHASE MODEL	BACKWARDS MAPPING
— Purpose —		
Delineation of the system in which a Transformational Change is envisioned	Identification of the system's state with regard to Transformational Change	Process planning: break down long-term vision into more immediate, concrete actions
Identification of: » the core problem » cause and effect relationships	Identification of suitable interventions to foster Transformational Change	Develop (timed) portfolio of actions
Exploring and understanding the dynamics of the system		Identify which actors can focus on which actions
— Timing —		
Before a decision on concrete interventions take place	In close relation with Systems Analysis, but not before	When concrete interventions are planned (after Systems Analysis and Phase Model)
Repeated regularly for identification of changing parameters	Best reviewed in conjunction with Systems Analysis	Can be used to assess how ongoing actions fit into a wider, long-term vision

3.3.1 Systems Analysis and Mapping: Understanding the System

— Purpose —

Delineation of the system in which a Transformational Change is envisioned

Identification of:
- the core problem
- cause and effect relationships

Exploring and understanding the dynamics of the system

— Timing —

Before a decision on concrete interventions take place

Repeated regularly for identification of changing parameters

Description of the Tool[13]

Transformational Change is necessarily complex. It includes many different variables that do not follow regular patterns. Identifying the "right" variables and gaining an understanding of the underlying cause-effect relationships can help to identify leverage points and detect which interventions have the strongest impact for supporting your long-term vision.

From the micro to the macro level, Systems Analysis techniques allow for a better understanding of problems and of the context in which they arise. They are a means of tackling the "wicked problems" that are characteristic in complex systems: *"Social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing"*.[14]

At the outset of every project the aim is to find the most suitable and effective means of intervening into the system. It is crucial to concentrate on the specific contributory elements of the system. Thus, to identify the best point of intervention and, in certain cases, to outline possible future scenarios, it is necessary to map the causal chain of the problem-creating system.

Systems Mapping is a qualitative tool. At its core, it is a multi-stakeholder process to delineate the system in which a Transformational Change is envisioned, to identify and analyse which elements and which stakeholders interact within the system, which elements create the problem and where potential opportunities may lie.

The visual map of the system, which represents the interconnections between the key elements, is called the causal loop diagram (CLD). Although data sets or statistical data are not prerequisites for the analysis, quantitative data might be used to assist in clarifying certain trends. They can help to decide in disputed cases, but the quality of the assessment depends more on the quality of stakeholder-involvement.

This multi-dimensional analysis should be an essential step before any decision on concrete interventions takes place. By mapping and understanding the complex problem-creating system, the focus of the subsequent work can shift from prioritising the immediate and most apparent problems that need fixing to creating a long-term view and a holistic approach to reach it. At later stages, it may support project management by examining which parameters have changed through the implementation process.

13 The main ideas for this tool have been compiled from Probst and Bassi 2014 (see Recommended Reading at the end of this guidebook).

14 Chirchman 1967 in Probst and Bassi 2014.

Systems Analysis is entirely *a process of deliberation by the actors*. All it requires in terms of resources is: careful planning and preparation, a meeting room and a flipchart with paper and pens. Since each affected actor may contribute ideas, knowledge and potential options for action, Systems Analysis requires a wide range of stakeholders. Building a shared understanding of the nature and dynamics of the system increases the quality of the overall project design and stimulates organisational as well as individual learning processes.

It should be kept in mind that Systems Analysis is a time-consuming process that requires common effort and intensive and constructive communication. The quality of the analysis is highly dependent on the time and effort dedicated to the multi-stakeholder development process and on the extent to which multi-sectoral approaches are used. However, the analysis-planning process itself can create a feeling of ownership among the actors and enhance accountability, openness to work and willingness to work together.

Using the Tool

1. Define problem scope: Delineate the problem

Complex problems involve a great number of factors (causes and effects), which may be environmental, social, economic, institutional or technological in nature. In order to conceptualise and understand the actual problem, a first and essential step is to narrow down the focus of the investigation to the problem itself and to exclude all the factors not directly linked to it.

There is a fine balance in how narrow the boundaries should be: they should be sufficiently wide to involve the primarily affected factors and should avoid an oversimplified view of reality. On the other hand, they should be narrow enough to avoid the other extreme, a superfluous illustration of the system under discussion. This delineation means a distinction of the (a) internal and (b) the external dimensions and of the entirely (c) excluded elements. Internal variables affect and are impacted by the problem. External factors influence the system and the problem or the solution but there is no direct, primary cause-effect relationship. All the factors that are not related to the problem should be excluded.

2. Identify the core problem

It is fundamental to explicitly and clearly define and formulate the core factor, the essential problem to be solved by the project. *What is the issue at stake and what is the change objective?* At this stage it is crucial to be aware of what is within and what is beyond the capacities/capabilities/aims of the project.

For instance, tackling water scarcity in rural areas may involve different causes, such as household water consumption, water infrastructure, damming, deforestation, government subsidies and various incentives. Water scarcity may be related to, or caused by, massive water extraction in upstream countries. Typically, it is well beyond the capacities of local projects to tackle crossborder problems. Therefore, even if water scarcity is, to a significant degree, due to another country's behaviour, for reasons of project-effectiveness the problem is better limited to internal dimensions that can be meaningfully tackled. The knowledge of crucial external factors should, however, be communicated to actors so that they may be in a better position to act on them.

3. Identify cause & effect relationships

It is through an understanding of the structure and of the dynamic properties of the system that appropriate leverage points can be identified. Once again, it is important to find a good balance with respect to the scope of the map, i.e. to respect the predefined boundaries of the system (see step 1 above). The map is an abstraction of the system, which serves to depict and conceptualise the problem-creating system, but it does not need to be all-encompassing.

The analysis starts with the identification of the building blocks of the system. When identifying causes and effects of any given problem, it is important to consider that:

- the identified cause should have occurred prior to the assumed effects;
- a single effect can be the result of multiple causes and a single cause can have multiple effects on the analysed system; and
- the causes should be clearly and directly linked to the effect. The direct (primary) causes need to be distinguished from the indirect (secondary) ones because this can help to evaluate how far-reaching the problem actually is.

4. Visualise: Map systems dynamics with a causal loop diagram

Causal loop diagrams (CLDs) are graphic maps that help to explore the interconnections between key elements in the given system. They are integrated maps of various components of the system that depict their dynamic interplay. CLDs illustrate the causal chain that determines the problem to be solved. Throughout the process it is important to shift the attention from the manifestation of the problem, i.e. the events, to the problem itself. Notable events that draw remarkable attention to an issue (e.g. tipping points) are often merely the symptoms of important underlying processes: the aim of the analysis is to identify these processes. An example of a detailed system map can be found in our example on page 32.

Drawing causal loop diagrams

1) Write down the key variable representing the identified central problem on a blank piece of paper.

2) Then add the causes one by one and connect them with causal links indicated by arrows and determine the polarity (the sign of the casual relation, positive [+] or negative [–]). Use nouns or noun phrases rather than verbs to define causes.

3) Add and link more variables until a sufficient number of variables have been introduced. A sufficient expanse is reached when cause and effect relationships cannot be extended any more, i.e. no further causes can, in a meaningful manner, be attached to the causes.

4) Where variables feed into each other and a circular relationship takes shape, a feedback loop is created. Not only do feedback loops feature the complex and dynamic structure of the system, they also help to detect suitable leverage points for interventions.

It is important to keep in mind that there is no need to describe every detail of the system—the aim should be to show those aspects of the feedback loops that lead to the observed problem. In short, map the problem, not the entire system. Keeping a balance between a superfluous and an over-simplified graph, the whole process and the graph created should adequately serve the subsequent decision-making processes.

Important aspects of causal loop diagrams

Stocks and Flows: It is important to be mindful of the differences of stocks and flows within a CLD. One important advantage of the causal-loop diagrams is that they help to avoid the trap of analysing only a static picture of the system (a snapshot of the actual state), Instead, they model the trends within the system. It is important to pay attention not only to the continuous modifications (flows) in the system but also to its history and current state (stocks). *For instance, the rate of decrease of fish catches will inform you about the trend of fish extraction but will not tell you how much fish is left in that particular fishery.*

Delays and long-term processes: A challenge of the CLD implementation phase is the consideration of the time dimension of the causes and effects. The actual and perceived states may differ significantly and effects may occur with a significant delay after the cause. These time lags may be indicated on the graph . Furthermore, separate loops may be necessary to represent short-term and long-term cause-effect relationships.

5. Draw conclusions, investigate factors that trigger change

An analysis of the final diagram starts by "reading the diagram" In addition to checking the consistency and validity of the diagram, this means reevaluating the overall system pattern that you have created in a more in-depth way, in order to understand the extent to which factors influence the causes of the problem.

The main objective of this final phase is to identify key barriers to change and strategic points for intervention. This visualisation helps to understand the system's set-up and reveals directions for the decision-making process. A detailed diagram may even allow for projections to be made regarding future trajectories in response to different implemented decisions. A detailed stakeholder diagram can help to project the reactions of different actors to a proposed change.

An elaborate causal-loop diagram can elucidate how, for instance, the effects of a certain government subsidy will trickle through the system and what the likely reactions within the system will be.

By this phase, with a profound understanding of the system, some entry points for action will come into focus. Discussions about interventions should consider the following:

- Interventions should be designed to make the system start working in your favour, to solve the problem and halt the factors that feed into the problem. The solutions should not be imposed on the system but should emerge *from* it.
- Watch out especially for problems generated by processes that the actors within the system have created and the causes of problems within their own structures.
- There may be factors that are beyond the power of the project to address. It is crucial to select the variables that can be directly influenced through the decision-making process.

Finally, when considering possible solutions, with the help of the Systems Map you can better take into consideration where undesirable side effects might be potentially created as a result of the planned interventions. Similarly, system maps will help you to identify cross-sectoral and multi-actor synergies.

Drawing a causal loop diagram: Systems Analysis of the Tisza River Management Regime (Sendzimir et al. 2008)

The problem: *The Tisza River, one of the largest tributaries of the Danube is creating some of the most extreme floods in Europe. In addition, the river and the local population in Ukraine and Hungary have witnessed several disastrous pollutions when industrial accidents precipitated toxic spills of heavy metals and cyanide. Natural and man-made disasters and a chronic sense of uncertainty have had devastating consequences on both nature and society. A long slide into rural decline (closing businesses, declining quality of public services) and emigration from the small towns of the region are the manifestation of a long-lasting downward spiral that large-scale river engineering has created.*

The approach: *In a joint dialogue, local and international experts, practitioners and local leaders applied system dynamics modelling to explore barriers and bridges for the transformation of the current dysfunctional river management regime of the Tisza River Basin. The aim of the study was to discover existing paradigms of river management and add a new perspective to the policy-dialogue of river management.*

Systems mapping *was used to visualise both the dominant paradigms creating and perpetuating the problem and the processes that counteract and sustain an alternative vision of a socio-ecological well-being. Thus, not only the drivers and impacts of the issue were mapped but also they were arranged into paradigm clusters and linked up to each other. The goal of the study was to assess the transformation potential of the river management system, based on the idea that the trajectory of a complex system depends on the set of feedback loops that dominates.*

The system map highlights that the established policy dialogue has ultimately been dominated by a defence-oriented river engineering paradigm described as "Protect the Landscape from the River". The massive reshaping of the river system through hydro-engineering operations pairs with an agricultural system characterised mainly by large-scale intensive agriculture based on dryland grain monocultures. In the discrete cases where an alternative approach was applied, called "Live with the River", management efforts proved to be more successful in creating resilient local social-ecological systems.

However, the inertia of the long-standing model of ecological-engineering impedes the adaptive, resilience-oriented view from escalating. By employing a systemic mapping approach, the authors were able to identify several sources of systemic resistance where leverage is badly needed. These root causes had not been apparent before because of the circular relationships that lead to an unexpected self-reinforcement of the system. The authors deduced that the system (as depicted by the map) will only change from a system shock creating a tipping point, or by constantly building capacities and showing alternatives to the society in this area.

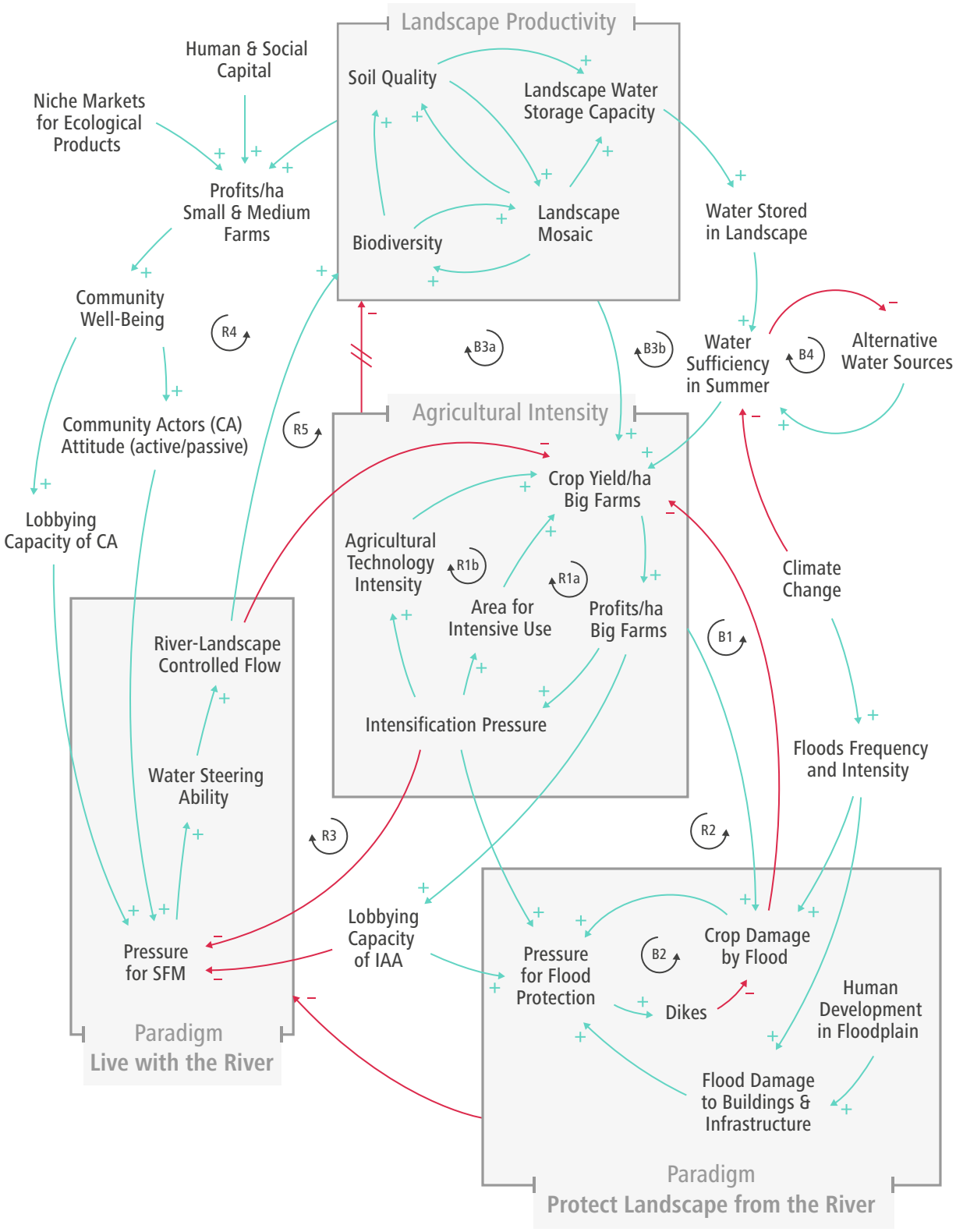


Figure 3.2
Causal loop diagram for competing use paradigms for river management in the Tisza River Basin (Sendzimir et al. 2008)

3.3.2 Phase Model: Identifying the State of the System

Description of the Model

The Phase Model ("S-curve") can be used as a visualisation tool for identifying the state of the system you want to change. It can be used on various levels: for a whole country, for a sector, or for individual areas of intervention. A general assumption is that the current, established and commonly accepted pathway is less sustainable, higher carbon and less resilient to development than the one envisaged. Any intervention should, therefore, be geared towards transforming development approaches into sustainable, specifically low carbon and resilient, pathways. Similar models to the Phase Model have been developed in the context of behavioural change and change management approaches.

"First they ignore you, then they laugh at you, then they fight you, then you win." —Mahatma Gandhi

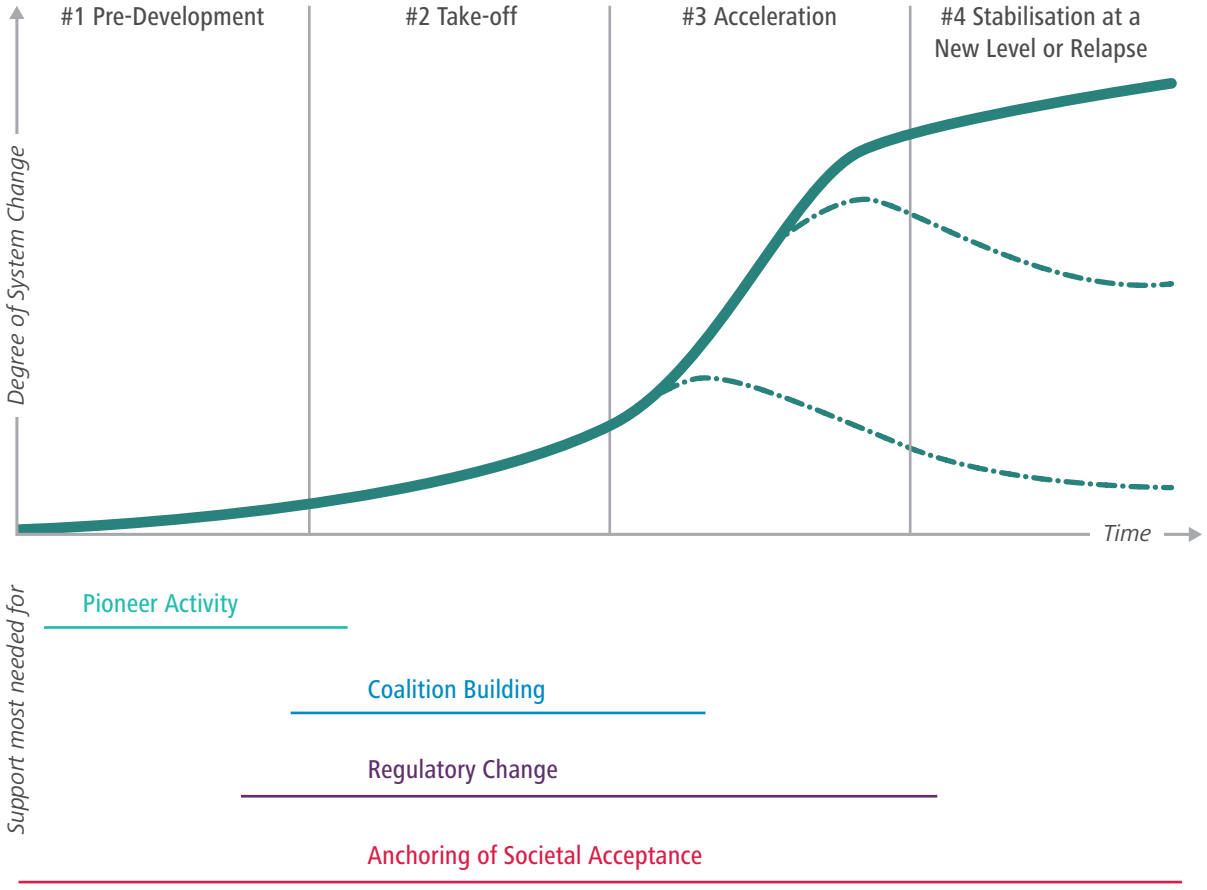


Figure 3.4
Stages of Transformation Processes
Phase Model curve and intervention types (own illustration, adapted from Rotmans et al. 2000)

— Purpose —

Identification of the system's state with regard to Transformational Change

Identification of suitable interventions to foster Transformational Change

— Timing —

In close relation with Systems Analysis, but not before

Best reviewed in conjunction with Systems Analysis

The Phase Model is intended as an anchor for discussions within a stakeholder group. As such, it sketches the "level of transformability" on the y-axis versus time on the x-axis in a stylised fashion. The curve represents the idealised path that a transformational process of any kind will typically take.

In practice, transformational processes will most likely not be as smooth. This is because transformational processes incorporate many smaller factors (e.g. individual proponents and opponents of change, institutional and political processes), which may propel or delay the process as a whole.

Different actors will put varying emphasis on such processes, which allows for a more comprehensive collective understanding of transformational processes if the model is used as a group discussion tool. It should, therefore, be used early in the project design stage and can be reapplied to review changes that have occurred over time.

Phases of Transformation and Possible Interventions

Typically, every transformative process a system undergoes can be depicted as a (stylised) S-curve. While transformations are processes, not discreet steps, we have identified a number of typical phases.[15] Depending on the phase, different types of interventions may be of more use in order to achieve the best impact and to support the system in moving to the next phase. In order to plan intervention strategies, it is helpful to identify which (idealised) phase of a transformative process the system is at. Visualising the "transformative phase" of the system will also help you to discuss possible interventions with stakeholders and government partners and, in this way, to collectively refine your understanding of the process a country is undergoing.

15 While the model can be adapted to any number of phases, we distinguish four that we see as characteristic of any transformational process.

1. Pre-Development

Within this phase, development occurs along entrenched pathways. Paradigms are (almost) unquestioned and institutions are stable. Some irritations exist—caused by external pressure or by symptoms of unsustainable development, which become more and more visible. However, major stakeholders and key players are either not aware of existing alternative solutions, or perceive them as being too complicated/too costly/otherwise unfeasible.

Note that in countries undergoing major transformation processes of fundamental paradigms *(e.g. political and societal shifts through military coups)* other paradigms may continue virtually unchanged *(e.g. electrification through grid extension and fossil power plants).*

In this phase it is important to become aware of, and to allow, experimentation with alternatives:

» Foster Alternative Thinking

Alternatives need to be made "thinkable". Fundamental questions need to be raised *(e.g. is there enough solar radiation to provide enough energy for our country? Could flood prevention protect important supply chains?)* Research studies can help to provide a new basis for an informed dialogue.

» Demonstrate New Possibilities & Create Niches For Experimentation

Pilot projects help to make alternatives tangible *(This is what an eco-house looks like—it can actually be built)*. International cooperation has a long tradition of provid-ing technology and capacity support to pilot projects.

» Create New Forums For Discussion

The new thinking is an outsider to the strong mainstream. The exploration of new ideas requires protected spaces. *(e.g. is it possible to ask "Do we need a new economy?")*. Capacity development can search for open minds and bring them together.

2. Take-off

In this phase, the system starts to absorb new ideas and concepts. Irritation and problem awareness have increased and a number of different solutions to the problem at hand exist. In this phase, there is no common agreement on which (set of) solutions is the best: technologies are not yet competitive; business models are not yet firmly established.

However, experiments become larger and larger. Alternatives spread more widely, become more visible and become accepted as potentially realistic. On the other hand, proponents of the old system may switch from ignorance and mockery *(e.g. statements like "more than 3% of PV is technically impossible")* to concerted opposition as a possible paradigm shift becomes visible *(lobbying against new solutions).*

Interventions in this phase may include:

» Scaling-up of Niches

In this phase, alternatives need protected spaces to grow and mature. This is way beyond individual pilot projects—experiments need to be scaled up and replicated. These niches can be at subnational level *(e.g. eco-towns, low carbon settlements)* or supported by national regulations *(feed-in tariffs for renewables).*

» Coalition Building

Innovators and niche actors need to meet and exchange ideas, to define common ground and lobby for the alternatives they wish to explore. International development cooperation can support the advocates of a paradigm shift with capacity support and provide effective forums for stakeholder dialogue and exchange.

3. Acceleration

Within this phase, new solutions challenge the existing mainstream. They become acknowledged and widespread. The speed of change increases and incidents in this phase may be broadly perceived as "tipping points". The consequences for the larger system become apparent. The interconnections between different problem fields and sectors become more and more apparent *(e.g. electro mobility is not only a transport issue, but heavily influences challenges and potentials in the power sector. Flood protection does not only prevent damage in housing and infrastructure, it also influences the water sector and prevents disease spreading).* International cooperation may become more important *(e.g. international power grids to balance intermittent renewable electricity).* If the transformation runs successfully, technological, institutional, social and economic innovations mutually reinforce each other *(e.g. the more people buy eco products, the cheaper they become, being sold in more and more shops—which make more people buy eco products. The more people are interested in car sharing models, the more it becomes a business model, the more companies will enter and the more cars will be available, making it more attractive for new customers.).*

However, opposition to the transformation may continue or even increase radically by the former 'winners' from the previous development pathway, who may now face severe losses in political or economic terms. Making new solutions a favourable option may include compensating for individual losses.

In this phase it is crucial that frameworks and structures supporting the new pathway as the dominant solution are strengthened or newly established, including laws and regulations.

- Development cooperation should support governmental actors to develop such frameworks. This includes legal advice, capacity building and institution building, including the support of cross-departmental and cross-sectoral cooperation.
- It should also support new players who need to build up lobbying power in favour of the new system. In order to gain societal acceptance for the transformative process, it is crucial to integrate civil society actors and to give them sufficient voice.
- Another focus should be on assuring the continued implementation of actions defined in the political realm. A common barrier is a lack of capacity at lower political levels. Capacity development should therefore incorporate multiple political levels in an integrated way.

Obviously, it is very difficult to initiate this support when a system has already reached the highly dynamic transformation phase. Therefore, it is important to prepare and instigate this support well in advance, in order to have an established support structure that can be flexibly adapted to urgent needs at the appropriate moment.

4. Stabilisation or relapse

Ideally, the new pathway is now anchored. The magnitude of change decreases and the system stabilises. However, stabilisation may occur at any level from a total relapse to the system's original state if structures and proponents of the "old" system have proved more persistent, to a fully transformed system if the process has proven fully successful.

During this stage it is too late to intervene strongly; instead, long-term processes from earlier phases pay off. It is, therefore, crucial that throughout the whole transformation process, acceptance of climate-friendly, resilient solutions is anchored within society. Good communication plays an important role, but information and marketing alone will not suffice. It is essential that large and influential sectors of society see the benefit of the new system. Questions of cost/benefit distribution and "fairness" of the new system need be addressed at early stages of the transformation *(e.g. when designing law, business models, mitigation technologies and adaptation strategies).*

Generally, with every phase the level of interdependence and therefore the need for cooperation rises: while in phase 1 interventions will have a mainly insular character, phase 2 already moves toward a degree of cooperation that, at national level at least, will require cooperation within given sectors. Within the acceleration phase the level of cooperation will transcend sectoral boundaries and move towards cross-sectoral and inter-departmental levels, which may make intergovernmental working groups necessary and useful.

Using the Model

1. Identification of the system's state

The Phase Model can be used as a visualisation tool to help identify the current state that a country or sector is in with respect to an intended transformation (long-term vision). We found the tool very helpful for structuring and facilitating group discussions and for helping a group of experts to develop a common view with respect to the questions: where are we today and where are we heading?

The S-curve is not a tool for developing a common vision. However, in using the concept, it becomes clear whether or not a group shares the same vision or where there are differences in the long-term vision.

2. Identification of interventions

Depending on the current phase of the system, you can discuss and identify interventions that are especially useful to "move you along the curve". This guidebook only provides rough guidance about the types of interventions that will be suitable, as this will depend mainly on the particular country and system you are targeting.

3. Selection of tools

The Phase Model is a "meta-tool" that can be useful to select tools that specifically target certain phases. As an example, tools for the promotion of small-scale demonstration are especially suited to the first and, to a lesser degree, the second phase. From the second and especially the third phase onwards, tools that promote cross-sectoral cooperation gain importance as greater political anchoring is needed.

Possibilities for Refinement

In discussions with practitioners we encountered high interest in the Phase Model of Transformational Change, which was perceived as highly applicable to strategy development and project planning. To our knowledge, this is the first time that this model has been adapted to a climate and development context., and there is ample scope for further development. We highly encourage practitioners to take our suggestions as a starting point, and to evolve the model according to their needs.

This could include:

- *Developing reliable criteria for identifying the state of a system on the curve.*
- *A key question is whether it is possible to identify generic criteria—or whether criteria would need to reflect the respective domain for which the tool is to be used (e.g. system types (social, technological, …), mitigation/adaptation, different sectors, or country types).*
- *Zooming in into phase 2 and identifying suitable sub-phases.*
- *A majority of systems in the climate and development context can be located in the take-off phase. An identification of sub-phases would allow for finer positioning of the system and, consequently, for a more targeted choice of suitable interventions.*
- *Developing a more action-based model out of the current heuristic.*

This would include more elaborate and specific guidance on factors and actions that can help to push transformational processes along the curve. (e.g. necessary prerequisites, tipping points/windows of opportunity, conducive activities)

3.3.3 Backwards Mapping: Holistic & Integrated Planning

— Purpose —

Process planning: break down long-term vision into more immediate, concrete actions

Develop (timed) portfolio of actions

Identify which actors can focus on which actions

— Timing —

When concrete interventions are planned (after Systems Analysis and Phase Model)

Can be used to assess how ongoing actions fit into a wider, long-term vision

Description of the Tool[16]

The Backwards Mapping tool is at the core of "Theory of Change" (ToC) approaches. The ToC approach has been developed as a comprehensive, holistic approach to strategic planning, monitoring and evaluation. ToC approaches are increasingly used by various development organisations as well as governmental, civil society and research bodies.

ToC approaches and the more commonly-known logical frameworks ("log-frames") stem from a similar theoretical background, and as such are sometimes hard to differentiate. However, there are some important differences in practical use.

Log-frames typically focus on narrow result-chains of the specific activity they are designed for. Impacts of other activities on desired outcomes as well as the specific activity's influence on other activities are seldomly taken into closer consideration.[17]

ToC approaches offer a broader focus on how to achieve an ultimate, overall goal instead of outcomes of single projects. As such, they can be used to design more holistic pathways to a desired goal, and incorporate multiple actors and activities. The ToC's goal orientation also allows to select activities that will fit best within a portfolio geared at a national outcome. These may sometimes differ from activities that will seem more effective or efficient if viewed in a more isolated project context.

16 The main ideas for this tool have been compiled from Bours, McGinn and Pringle 2014 (see Further Reading at the end of this guidebook).

17 see Vogel 2012

Maureen O'Flynn (2012) summarises the approach as follows: *"Theories of Change can be set at organisational levels, programme levels and even project levels. Although there are endless variations in terms of style and content, the basic components include a big picture analysis of how change happens in relation to a specific thematic area; an articulation of an organisation or programme pathway in relation to this; and an impact assessment framework which is designed to test both the pathway and the assumptions made about how change happens."*[18]

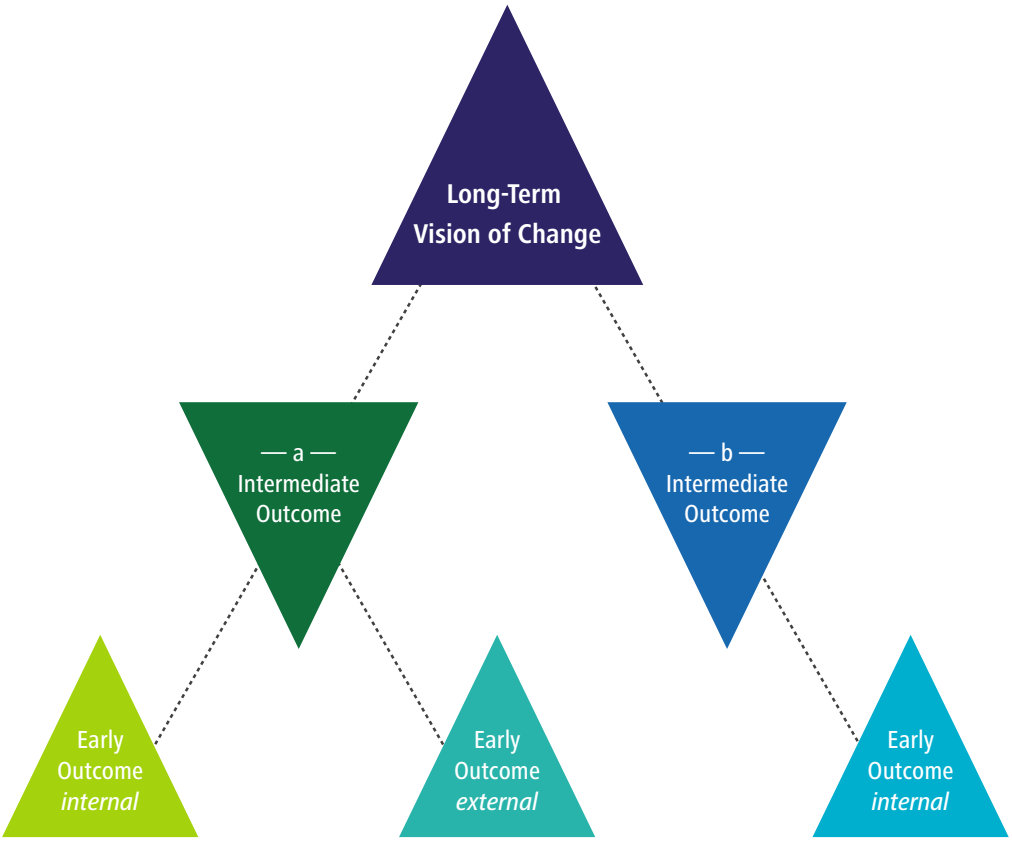
18 O'Flynn 2012.

If applied at national level, the result of a ToC approach can be an implementable national climate strategy that incorporates different projects and agencies in a staggered, goal-oriented process.

"... a big picture analysis of how change happens in relation to a specific thematic area"

—Maureen O'Flynn

Consequently, at the outset and at the heart of a ToC analysis is the definition of the "big picture", a long-term vision or goal of what is ultimately to be achieved. Then, working backwards from this goal, pathways to reach that goal are outlined. This process is often known as "Backwards Planning" or "Backwards Mapping", a term we use for the purpose of this paper. The result is often represented as a flow-chart resembling a more complex form of the one depicted above.



Using the Tool

The pathway will most likely take a pyramid form, as most of the time every step on the path will have a number of crucial preconditions. Generally not all of these preconditions can be met by a single organisation or programme. A Backwards Mapping approach to planning can, therefore, help to identify the need for collaborative approaches with other development organisations, government agencies or other stakeholders.

Backwards Mapping can be used as a concrete planning tool in order to design integrated aproaches to achieve a given long-term goal, or as a *"... deeper reflective process and dialogue amongst colleagues and stakeholders, reflecting on the values, worldviews and philosophies of change that make more explicit people's underlying assumptions of how and why change might happen as an outcome of the initiative."*[19]

19 Vogel 2012

For planning interventions geared at Transformational Change, the Backwards Mapping tool benefits greatly from a clear picture of the wider system in which the intervention will take place and the ongoing processes that define the system's transformational state. Backwards Mapping should, therefore, be used after Systems Analysis and should be based on discussions using the Phase Model.

1. Identify the goal

A clear and shared vision of how a successful transformation will look is key to this tool, as well as to Transformational Change processes in general. Goals should be as clear as possible and should represent the common view of all stakeholders involved in the Backwards Mapping process. Avoid being too vague *(e.g. "more resilience to climate change")*, as a vague goal may have very different connotations for different stakeholders and, consequently, may lead to disparities later on. As an example, a goal for an adaptation strategy could be: a low carbon, healthy urban community with secured housing structures and diversified economies, which are resilient to climate change.

2. Sketch out the pathways towards this goal

This step is at the heart of the tool: to identify intermediate preconditions backwards in time from the shared goal, towards the present. This means that you identify first the necessary preconditions to reach your ultimate goal, then identify the preconditions for reaching these and so forth. These preconditions all represent milestones on the path to the ultimate goal. Your outcome will most likely be a causal pathway "pyramid", in which many steps eventually lead to your desired outcome. Try to avoid the tendency (found in many strategies) of focusing on ultimate goals and first steps in

the present, but leaving intermediate steps vague. While you should allow for flexibility, you should also strive to develop a logical causal chain.

Referring to the above mentioned adaptation example, intermediate outcomes/preconditions could be:

- *informal settlements transformed into formal settlements;*
- *infrastructural supply available for everyone;*
- *men and women with diverse skills, knowledge and access to legal sources of income; and*
- *urban planning and management providing sustainable and secured land management plans.*

3. Operationalise

The milestones in the causal pathway pyramid represent outcomes that have to be met prior to taking the next step. In order to demonstrate that an outcome has been reached, progress indicators must be assigned. These can, but do not have to, be quantifiable. In a transformational process, many indicators will tend to take on the form of a qualitative narrative of what has been achieved.

To return to the example, one indicator would be the reduction of informal settlements to a level of 50%. It must be clarified what levels should be reached in order to achieve the overall goal. These rates cannot be reached by one project, but can be achieved via a larger and diversified project portfolio.

4. Select specific activities

In order to reach the outcomes identified you then specify interventions. In this stage, you should focus on the "big picture" to reach your ultimate goal. This means that some of the activities may not be the most efficient or effective when viewed in isolation, but will fit best within the overall framework. You may not want, or be able, to target some of the outcomes that you have identified yourself. The ToC process, therefore, helps you to identify crucial steps that can only be taken collaboratively or by engaging with other actors.

One activity could be to support the drainage systems in order to reach the goal of an infrastructural supply that is available to everyone. Keep in mind the other preconditions and goals and interlink them with possible other sectors e.g. water supply and land management.

5. Be flexible

The ToC approach can be criticised as being an inflexible, mechanistic approach if applied too rigorously. Also, it is not possible to take every possible happenstance into account when planning for future outcomes. This approach, therefore, works best if it is used as an ongoing process that is regularly updated and continually reviewed/discussed. Consequently, the result of a Backwards Mapping approach should not be seen as a final, static product, but as a living strategy that incorporates bottom-up feedback into the overall top-down strategy.

4 Outlook

In order to adequately address the issue of climate change, a paradigm shift both in mitigation and adaptation activities is necessary. From global experiences of supporting sustainable development we know that despite all advances, persistent problems remain that time and again lead to set-backs in sustainable development pathways. Addressing these problems requires a critical, and sometimes radical, questioning of fundamental paradigms.

We believe that a Transformational Change in a large number of systems and domains is necessary. Not only will technical systems in very different sectors have to be changed, but, more fundamentally, established approaches to mitigation and adaptation will have to be challenged, and, if necessary, themselves transformed. Not every solution will be successful, but every approach will trigger more learning processes that will give answers to some very basic questions: where has change towards sustainable development been successful; where is it not; and why?

In consequence, this also means a transformation of development and climate finance. One example could be to switch logics from mainly project-based thinking to a more open, country-led portfolio approach. Again, there must be a learning curve, and some approaches will be more successful than others.

In this guidebook, we have outlined some important aspects of a global transformation agenda. As a first step, we have attempted to give the concept of Transformational Change a better shape in order to kickstart discussions on what it may actually mean for a climate and development context.

As a second step, we have tried to provide some advice to put the concept into practice. The guidelines we propose can in our view be easily adapted to design as well as evaluate transformational actions on the ground. We are confident that our guidelines and tools will serve transformational processes well. In time, other approaches and tools will add to our first compilation, and add more possibility for success.

Writing this guidebook in a way has been a Transformational Change process in itself for us as authors, and we believe that it is not at its end. We encourage you to apply and test our concepts and ideas, and tell us about your experience. We hope to enter into a fruitful dialogue, and together bring our global agenda for Transformational Change forward.

5 Recommended Reading

Background paper to this guidebook

More conceptual and theoretical information on Transformational Change in a Q&A style in a background paper to this guidebook:
Göpel, Maja (2014): *Navigating a New Agenda—Questions and Answers on Paradigm Shifts and Transformational Change*
http://wupperinst.org/en/projects/details/wi/p/s/pd/482/

We would like to highlight a number of papers and books that have had an especially strong impact on the content of this guidebook.

Detailed info on the GIZ's approach to climate finance readiness:
GIZ (2014): *Ready for Climate Finance: GIZ's approach to making climate work.* Eschborn/Bonn/Berlin: Deutsche Gesellschaft für internationale Zusammenarbeit GmbH
www.giz.de/expertise/downloads/giz2013-en-climate-finance-approach.pdf

Conceptual thoughts on operationalising paradigms shift for the GCF:
Vieweg, Marion and Ian Noble (2013): *Incentivizing Paradigm Shift Within The GCF Allocation Framework.* Berlin: Climate Analytics.
www.climateanalytics.org/sites/default/files/attachments/publications/GCF%20Allocation%20Options_Background%20Paper%202.pdf

Further work on characteristics of Transformational Change processes:
Tanner, Thomas M. and Adithya V. Bahadur (2013): *Distilling the characteristics of transformational change in a changing climate.* In: Proceedings: Transformation in a changing climate. Oslo: University of Oslo.
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A detailed guide on applying systems theory to decision making & strategic design:
Probst, Gilbert J.B. and Andrea Bassi (2014): *Tackling complexity: A systemic approach for decision makers.* Sheffield: Greenleaf Publ.

Hands-on guidance on using the Theory of Change Approach for adaptation:
Bours, Dennis, Colleen McGinn and Patrick Pringle (2014): *Theory of Change approach to climate change adaptation programming (Guidance Note No. 3).* SEA Change CoP, UKCIP.
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